

Polymer Foams Handbook Engineering And Biomechanics Applications And Design Guide By Mills Nigel Butterworth Heinemann2007 Hardcover

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Computational Modelling and Advanced Simulations - Justín Murín 2010-12-25

This book contains selected, extended papers presented at the thematic ECCOMAS conference on Computational Modelling and Advanced Simulations (CMAS2009) held in Bratislava, Slovakia, June 30 – July 3, 2009. Modelling and simulation of engineering problems play a very important role in the classic and new composite material sciences, and in design and computational prototyping of modern and advanced technologic parts and systems. According to this, the existing numerical methods have been improved and new numerical methods have been established for modelling and simulation of more and more complex and complicated engineering problems. The present book should contribute to the effort to make modelling and simulation more effective and accurate.

Polymeric Foams - S.-T. Lee 2022-05-19

Polymeric Foams: Innovations in Technologies

and Environmentally Friendly Materials offers the latest in technology and environmental innovations within the field of polymeric foams. It outlines how application-focused research in polymeric foam can continue to improve living quality and enhance social responsibility. This book: Addresses technological innovations including those in bead foams, foam injection molding, foams in tissue engineering, foams in insulation, and silicon rubber foam Discusses environmentally friendly innovations in PET foam, degradable and renewable foam, and physical blowing agents Describes principles as well as applications from internationally recognized foam experts This work is aimed at researchers and industry professionals across chemical, mechanical, materials, polymer engineering, and anyone else developing and applying these advanced polymeric materials.

Proceedings of SAE-China Congress 2015: Selected Papers - China Society of Automotive Engineers 2015-11-30

These proceedings gather outstanding papers submitted to the 2015 SAE-China Congress, the majority of which are from China, the biggest car maker as well as most dynamic car market in the world. The book covers a wide range of automotive topics, presenting the latest technical achievements in the industry. Many of the approaches presented can help technicians to solve the practical problems that most affect their daily work.

Engineering Plasticity and Its Applications -

Textiles for Sportswear - Roshan Shishoo

2015-05-28

Textiles for Sportswear is an important book that systematically covers key trends in design and materials, the use of novel and smart fabrics, and a range of specific applications. The book begins by surveying the principles of textile applications in sport, including design, materials, and production technology. The uses of smart textiles in sportswear are then

examined, from intelligent materials to wearable technology. Final sections of the text explore comfort in sportswear, sportswear for protection, and recent advances in sportswear technology that are currently being applied to particular sports. Reviews the principles of textile applications in sport, including design, materials and production technology Examines the uses of smart textiles in sportswear Discusses how recent advances in sportswear technology are being applied to particular sports

Bionanocomposites - Carole Aimé 2017-07-24
Beginning with a general overview of nanocomposites, Bionanocomposites: Integrating Biological Processes for Bio-inspired Nanotechnologies details the systems available in nature (nucleic acids, proteins, carbohydrates, lipids) that can be integrated within suitable inorganic matrices for specific applications. Describing the relationship between architecture, hierarchy and function, this book aims at pointing out how bio-systems can be key

components of nanocomposites. The text then reviews the design principles, structures, functions and applications of bionanocomposites. It also includes a section presenting related technical methods to help readers identify and understand the most widely used analytical tools such as mass spectrometry, calorimetry, and impedance spectroscopy, among others.

Aspects of Polyurethanes - Faris Yilmaz
2017-09-27

Polyurethanes are formed by reacting a polyol (an alcohol with more than two reactive hydroxyl groups per molecule) with a diisocyanate or a polymeric isocyanate in the presence of suitable catalysts and additives. Because a variety of diisocyanates and a wide range of polyols can be used to produce polyurethane, a broad spectrum of materials can be produced to meet the needs of specific applications. During World War II, a widespread use of polyurethanes was first seen, when they were used as a replacement for rubber, which at that time was expensive and

hard to obtain. During the war, other applications were developed, largely involving coatings of different kinds, from airplane finishes to resistant clothing. Subsequent decades saw many further developments and today we are surrounded by polyurethane applications in every aspect of our everyday lives. While polyurethane is a product that most people are not overly familiar with, as it is generally "hidden" behind covers or surfaces made of other materials, it would be hard to imagine life without polyurethanes.

Applications Of Tensor Analysis In Continuum Mechanics - Michael J Cloud
2018-07-10

'A strong point of this book is its coverage of tensor theory, which is herein deemed both more readable and more substantial than many other historic continuum mechanics books. The book is self-contained. It serves admirably as a reference resource on fundamental principles and equations of tensor mathematics applied to continuum mechanics. Exercises and problem

sets are useful for teaching ... The book is highly recommended as both a graduate textbook and a reference work for students and more senior researchers involved in theoretical and mathematical modelling of continuum mechanics of materials. Key concepts are well described in the text and are supplemented by informative exercises and problem sets with solutions, and comprehensive Appendices provide important equations for ease of reference.'Contemporary Physics

A tensor field is a tensor-valued function of position in space. The use of tensor fields allows us to present physical laws in a clear, compact form. A byproduct is a set of simple and clear rules for the representation of vector differential operators such as gradient, divergence, and Laplacian in curvilinear coordinate systems. The tensorial nature of a quantity permits us to formulate transformation rules for its components under a change of basis. These rules are relatively simple and easily grasped by any engineering student

familiar with matrix operators in linear algebra. More complex problems arise when one considers the tensor fields that describe continuum bodies. In this case general curvilinear coordinates become necessary. The principal basis of a curvilinear system is constructed as a set of vectors tangent to the coordinate lines. Another basis, called the dual basis, is also constructed in a special manner. The existence of these two bases is responsible for the mysterious covariant and contravariant terminology encountered in tensor discussions. This book provides a clear, concise, and self-contained treatment of tensors and tensor fields. It covers the foundations of linear elasticity, shell theory, and generalized continuum media, offers hints, answers, and full solutions for many of the problems and exercises, and Includes a handbook-style summary of important tensor formulas. The book can be useful for beginners who are interested in the basics of tensor calculus. It also can be

used by experienced readers who seek a comprehensive review on applications of the tensor calculus in mechanics.

The Science and Engineering of Sport Surfaces - Sharon Dixon 2015-06-05

Sports surface design is crucial for the successful performance of sports skills and the reduction of injury risk. Surfaces have developed from natural materials such as turf, clay and cinder, to synthetic surfaces such as acrylic tennis courts, artificial turf for soccer and synthetic running tracks, while our understanding of natural turf has developed in terms of properties appropriate for different sports and surface sustainability. This book draws together the very latest research on biomechanical, medical and engineering approaches to the study of sports surfaces. Written by a team of leading international sport scientists, engineers and technologists, the book covers every key aspect of surface development and design, including: surface behaviour surface

classification, function, construction and maintenance influence of surfaces on player performance and injury surface test methods and monitoring development of natural turf and synthetic surfaces shoe-turf interaction future developments in sports surface technology. Representing the most comprehensive and up-to-date study of sports surfaces, this book is important reading for all researchers and professionals working in sports technology, sports engineering, biomechanics or sports medicine.

Fracture at all Scales - Guy Pluvinage 2016-09-13

This book is a compilation of selected papers from the 2014 New Trends in Fatigue and Fracture (NT2F14) Conference, which was held in Belgrade, Serbia. This prestigious conference brought together delegates from around the globe to discuss how to characterize, predict and analyze the fatigue and fracture of engineering materials, components, and structures using

theoretical, experimental, numerical and practical approaches. It highlights some important new trends in fracture mechanics presented at the conference, such as: • two-parameter fracture mechanics, arising from the coupling of fracture toughness and stress constraints • high-performance steel for gas and oil transportation and production (pressure vessels and boilers) • safety and reliability of welded joints This book includes 12 contributions from well-known international scientists and a special tribute dedicated to the scientific contributions of Stojan Sedmark, who passed away in 2014.

Poly lactide Foams - Mohammadreza Nofar
2017-09-18

Poly lactide Foams: Fundamentals, Manufacturing, and Applications provides an introduction to the fundamental science behind plastic foams, poly(lactic acid) and poly lactide foaming, giving designers tactics to replace traditional resins with sustainable and

biodegradable materials. The book then delves deeper into the technology behind PLA foaming, such as PLA/gas mixture characteristics, solubility, interfacial tension behaviors and crystallization kinetics of various types of PLA and their compounds. The foaming behaviors and mechanisms of various types of PLA and PLA compounds are extensively analyzed and discussed through different manufacturing technologies, namely extrusion foaming, foam injection molding and bead foaming. Interest in Poly(lactic acid) and PLA foams is extremely high - particularly as a potential replacement for styrenic resins - and the price of PLA resin is lower than ever before. This biopolymer has significant potential to improve the sustainability of the plastics industry. Poly lactide Foams have a range of potential applications, such as in construction, packaging, insulation, biomedical scaffolds, and others. However, processing and performance of PLA are not at the same level as other non-biodegradable resins. Introduces the

concepts behind foaming, poly(lactic acid) and PLA foaming Supports further research and development in PLA foams by covering the state-of-the-art in different manufacturing and processing methods Provides practical guidance for materials scientists and engineers in industry looking to replace traditional polymer resins with a sustainable, biodegradable alternative *Materials in Sports Equipment* - Mike Jenkins 2003-07-23

Improvements in materials technology have made a significant impact on sporting performance in recent years. Advanced materials and novel processing methods have enabled the development of new types of equipment with enhanced properties, as well as improving the overall design of sporting goods. The interdependence between material technology and design, and its impact on many of the most popular sports, is reviewed in this book. *Materials in sports equipment* presents the latest research, from a distinguished panel of

international contributors, into the chemical structure and composition, microstructure and material processing of the various materials used in a wide range of sports. The relationship between performance and design is examined in detail for each sport covered. Part one concentrates on the general use of materials in sports. Here, the reader is given a broad insight into the overall influence of materials in sports, and the significance of material processing and design. Part two focuses on showing how individual sports have benefited from recent improvements in material technology. It also analyses the way in which improvements in our understanding of biomechanics and the engineering aspects of sports equipment performance have influenced materials and design. Sports whose equipment is considered in detail include: golf, tennis, cycling, mountaineering, skiing, cricket and paralympic sports. The overall aim of the book is to make the reader aware of the interaction between the

type of material, its selection, processing and surface treatment, and show how this process underpins the performance of the final sporting product. It is essential reading for all materials scientists and researchers working in this rapidly developing field. A major handbook on materials in sports Practical guide to material selection and processing for equipment used in many popular sports Shows how material characteristics affect design and performance

Voids in Materials - Gary M. Gladysz

2020-11-30

All materials have voids in them, at some scale. Sometimes the voids are ignored, sometimes they are taken into account, and other times they are the focal point of the research. Voids in Materials: From Unavoidable Defects to Designed Cellular Materials takes due notice of all these occurrences, whether designed or unavoidable defects. We define, categorize, and characterize the voids (or empty spaces in materials) and we analyze the effects they have

on material properties. This second edition is an updated and expanded central reference for voids in materials and covers all types of voids, intrinsic and intentional, and stochastic and nonstochastic, and the processes and conditions that are needed to create them and is a valuable resource to students in the areas of mechanical engineering, chemical engineering, materials science and engineering, physics, and chemistry, as well as scientists, researchers, and engineers in industry. the effect of voids in materials; from low volume fraction defects and free volume in polymer networks to high void volume fraction foams and aerogels how and why voids are introduced into materials across the length scales biomaterial design used in vivo for soft, hard, and nerve tissue scaffolds metallic and geopolymeric foams additive manufacturing technologies used to tailor regularity (R) in the cell structure stochastic, nonstochastic, and Voronoi foams the latest techniques for characterizing voids new chapters, covering the

Kirkendall effect to create hollow and porous structures, and nanometer scale voids: nanotubes, zeolites, organic frameworks, and nanoporous noble metals

Monodisperse Highly Ordered and Polydisperse Biobased Solid Foams -

Sébastien Andrieux 2019-08-23

This book discusses the synthesis of chitosan-based solid foams using foam templating. Solid foams with pore sizes between a few micrometres and a few millimetres are widely used in a range of established and emerging applications, including filtration, catalysis, sound and thermal insulation, human protection, and tissue engineering. They are lightweight with large surface-to-volume ratios, and have excellent mechanical, acoustic, and thermal properties. However, most foaming processes are extremely complex, and there remains a lack of sound scientific understanding of—and therefore control over—the parameters that determine the properties of the material. One

route towards tailor-made solid foams is liquid foam templating, where the liquid foam is generated first (with the desired structure) before being solidified into a solid foam with the desired structure. This book describes how liquid foam templating can be used to synthesise monodisperse solid foams as well as solid foams with a tuneable polydispersity.

American Book Publishing Record - 2007

Heat Transfer in Multi-Phase Materials -

Andreas Öchsner 2011-07-18

This book provides a profound understanding, which physical processes and mechanisms cause the heat transfer in composite and cellular materials. It shows models for all important classes of composite materials and introduces into the latest advances. In three parts, the book covers Composite Materials (Part A), Porous and Cellular Materials (Part B) and the appearance of a conjoint solid phase and fluid aggregate (Part C).

Advances in Mechanics: Theoretical, Computational and Interdisciplinary Issues -

Michal Kleiber 2016-05-05

Advances in Mechanics: Theoretical, Computational and Interdisciplinary Issues covers the domain of theoretical, experimental and computational mechanics as well as interdisciplinary issues, such as industrial applications. Special attention is paid to the theoretical background and practical applications of computational mechanics. This volume

The Engineering Approach to Winter Sports -

Francesco Braghin 2015-10-06

The Engineering Approach to Winter Sports presents the state-of-the-art research in the field of winter sports in a harmonized and comprehensive way for a diverse audience of engineers, equipment and facilities designers, and materials scientists. The book examines the physics and chemistry of snow and ice with particular focus on the interaction (friction)

between sports equipment and snow/ice, how it is influenced by environmental factors, such as temperature and pressure, as well as by contaminants and how it can be modified through the use of ski waxes or the microtextures of blades or ski soles. The authors also cover, in turn, the different disciplines in winter sports: skiing (both alpine and cross country), skating and jumping, bob sledding and skeleton, hockey and curling, with attention given to both equipment design and on the simulation of gesture and track optimization.

Automotive Acoustics Conference 2017 -

Wolfgang Siebenpfeiffer 2019-04-25

Technische Akustik und NVH gehören zu den wichtigsten Indikatoren für Fahrzeugqualität und -verarbeitung. Mit den grundlegenden Veränderungen der Antriebstechnik rücken diese Aspekte daher zunehmend in den Fokus der Automobilforschung und -entwicklung. Fahrzeugarchitekturen, Antriebssysteme und Designgrundsätze werden weltweit wegen der

Emissionsgesetzgebungen, die energieeffiziente Fahrzeuge fördern, einer kritischen Betrachtung unterzogen. Schon in sehr naher Zukunft wird die gleiche oder eine höhere NVH-Performance durch Leichtbaustrukturen, kleinere Motoren mit Turbolader oder auch alternative Antriebsstränge erreicht werden müssen. Die internationale Automotive Acoustics Conference bietet hierbei ein wichtiges globales Forum für den Informationsaustausch.

Sports Materials - Thomas Allen 2020-01-24

Advances in materials are crucial to the development of sports equipment, from tennis rackets to skis to running shoes. Materials-driven improvements in equipment have helped athletes perform better, while enhancing safety and making sport more accessible and enjoyable. This book brings together a collection of 10 papers on the topic of sports materials, as published in a Special Issue of Applied Sciences. The papers within this book cover a range of sports, including golf, tennis, table tennis and

baseball. State-of-the-art engineering techniques, such as finite element modelling, impact testing and full-field strain measurement, are applied to help further our understanding of sports equipment mechanics and the role of materials, with a view to improving performance, enhancing safety and facilitating informed regulatory decision making. The book also includes papers that describe emerging and novel materials, including auxetic materials with their negative Poisson's ratio (fattening when stretched) and knits made of bamboo charcoal. This collection of papers should serve as a useful resource for sports engineers working in both academia and industry, as well as engineering students who are interested in sports equipment and materials.

Sandwich Composites - Senthilkumar Krishnasamy 2022-01-25

A composite sandwich panel is a hybrid material made up of constituents such as a face sheet, a core, and adhesive film for bonding the face

sheet and core together. Advances in materials have provided designers with several choices for developing sandwich structures with advanced functionalities. The selection of a material in the sandwich construction is based on the cost, availability, strength requirements, ease of manufacturing, machinability, and post-manufacturing process requirements. Sandwich Composites: Fabrication and Characterization provides insights into composite sandwich panels based on the material aspects, mechanical properties, defect characterization, and secondary processes after the fabrication, such as drilling and repair. FEATURES Outlines existing fabrication methods and various materials aspects Examines composite sandwich panels made of different face sheets and core materials Covers the response of composite sandwich panels to static and dynamic loads Describes parameters governing the drilling process and repair procedures Discusses the applications of composite sandwich panels in

various fields Explores the role of 3D printing in the fabrication of composite sandwich panels Due to the wide scope of the topics covered, this book is suitable for researchers and scholars in the research and development of composite sandwich panels. This book can also be used as a reference by professionals and engineers interested in understanding the factors governing the material properties, material response, and the failure behavior under various mechanical loads.

Foamability of Thermoplastic Polymeric Materials - Suprakas Sinha Ray 2021-09-24

Foamability of Thermoplastic Polymeric Materials presents a cutting-edge approach to thermoplastic polymeric foams, drawing on the latest research and guiding the reader through the fundamental science, foamability, structure-property-processing relationship, multi-phase polymeric materials, degradation characteristics of biodegradable foams and advanced applications. Sections provide detailed

information on foam manufacturing technologies and the fundamental science behind foaming, present insights on the factors affecting foamability, cover ways of enhancing the foamability of various polymeric materials, with special focus on multi-phase systems, discuss the degradation of biodegradable foams and special morphology development for scaffolds, packaging, acoustic and super-insulation applications, as well as cell seeding studies in scaffolds. Each application has specific requirements in terms of desired properties. This in-depth coverage and analysis helps those looking to move forward with microcellular processing and polymer foaming. This is an ideal resource for researchers, advanced students and professionals interested in the microcellular processing of polymeric materials in the areas of polymer foaming, polymer processing, plastics engineering and materials science. Offers in-depth coverage of factors affecting foamability and methods for enhancing the foamability of

polymeric materials Explores innovative applications in a range of areas, including scaffolds, acoustic applications, packaging and super-insulation Provides a comprehensive, critical overview of the state-of-the-art, possible future research directions, and opportunities for industrial application

Polymer Foams Handbook - Nigel J. Mills
2007

From crash helmets to packaging, this is the complete guide to understanding, selecting, processing and working with polymer foams.

[Manufacturing and Novel Applications of Multilayer Polymer Films](#) - Deepak Langhe
2016-01-04

Manufacturing and Novel Applications of Multilayer Polymer Films discusses the advancements in multilayer technology, including its capability to produce hundreds of layers in a single film by a melt coextrusion process. These engineered films can have significantly enhanced performance properties,

allowing films to be made thinner, stronger, and with better sealing properties. As recent developments in feedblocks and materials have opened up a range of new possibilities, this book discusses different feedblocks, and viscosity and material considerations. It is the first comprehensive summary of the latest technology in multilayer film processing and related applications, and is written from a practical perspective, translating research into commercial production and real world products. The book provides fundamental knowledge on microlayer coextrusion processing technology, how to fabricate such structures, structure and properties of such microlayers, and potential applications, thus helping research scientists and engineers develop products which not only fulfill their primary function, but can also be manufactured reliably, safely, and economically. Provides a fundamental knowledge of microlayer coextrusion processing, including how to fabricate microlayer structures, the properties of

microlayers, and potential applications, including optics, polymer film capacitors, and semiconductors Includes an in-depth analysis of all technologies used for producing multilayered films and structures by coextrusion processing Thoroughly assesses potential future trends in multilayer coextrusion technology, thus enabling engineers and scientists to stay ahead of the curve in this rapidly advancing area

Metal Matrix Syntactic Foams - Nikhil Gupta
2014-07-01

Complete guide for materials, engineering, modeling and processing of novel syntactic material Lightweight metal-type foams for aeronautical, recreational and electronic applications Focused on a new type of material, the book investigates the elements, synthesis and practical applications of metal matrix syntactic foams, which share properties of foams and metal matrix composites. The text reviews how syntactic foams are synthesized from different types of hollow particles and metal

matrixes. Part one explains processing techniques such as solidification and powder metallurgy and discusses foams made from a variety of matrix metals. Part two compares different syntactic foams based on density and strain rate. Original experimental data and modeling information are provided that show how metal matrix syntactic foams can be used for lighter weight components in vehicles, as well as for sensors and biomaterials.

Bio-based Plastics for Food Packaging

Applications - Vimal Katiyar 2017-07-19

This book discusses the development of bio-based plastics and associated nanocomposites in order to achieve targeted structural morphologies, and physical and chemical properties for use in food-packaging applications. In line with bio-based and/or biodegradable plastic matrices, the current status of the development of multifaceted bionanofillers is also explored in detail. This book begins by addressing the past, present and

future prospects of bio-based and/or biodegradable polymers in specific food-packaging applications, and the importance and advantages of such packaging over fossil polymer-based packaging materials.

Furthermore, this book also examines the current commercial overview of bio-based and/or biodegradable polymers and nanocomposites, and the structure-property relationship required for various advanced applications. Individual chapters detail bio-based polymers, bio-derived and microbial-derived plastics, which include exclusive investigations on the most promising polymers, such as polylactic acid (PLA) and polyhydroxyalkanoates (PHA), and their bionanocomposites, for food-packaging applications. Detailed discussions highlight the various properties of polymers for food-packaging applications including bio-based and/or biodegradable polymers and nanocomposites. The processing of blends using bio-based and/or biodegradable polymers and

non-degradable polymers for food-packaging applications are also featured. In addition, extensive discussions include different edible biopolymer-based coatings on food items which can act as effective carriers for improving the shelf life of food. Moreover, various end-of-life solutions of plastics such as recycling, reuse, composting and so on, for the safe disposal of plastic waste are reviewed. Finally, this book discusses migration studies, and safety legislation and regulations of such packages in contact with food, which are currently being performed by various organisations across the world. Throughout the book, detailed case studies are included on sustainable polymers, and associated nanocomposites, along with different perspectives on their industrial applications, and critical challenges and opportunities for developing biopolymer nanocomposites for food-packaging applications.

27th European Symposium on Computer Aided Process Engineering - 2017-09-21

27th European Symposium on Computer Aided Process Engineering, Volume 40 contains the papers presented at the 27th European Society of Computer-Aided Process Engineering (ESCAPE) event held in Barcelona, October 1-5, 2017. It is a valuable resource for chemical engineers, chemical process engineers, researchers in industry and academia, students, and consultants for chemical industries. Presents findings and discussions from the 27th European Society of Computer-Aided Process Engineering (ESCAPE) event

Engineering Plasticity and Its Applications - Jianjun Li 2011

Pushover analysis of structures considering strain rate effects / Wenming Wang, Hongnan Li -- Dynamical response of recycled concrete under cyclic loading / Xingwen Luo, Hailin Yao -- Theoretical study on the dynamic mechanical properties of the NBR composites under static pressure / Bo Qiao [und weitere] -- Investigation on computational method for crack of reinforced

concrete pipeline under internal pressure retrofitted with FRP / Wang Suyan, Liu Fei, Yu Wenhua -- Study on K[symbol]-curves of the concrete beam reinforced with CFRP / Dong Wei, He Huanan, Wu Zhimin -- Effect of loading rate on reinforced concrete member / Min Li, Hongnan Li -- Seismic response of concrete structure reinforced with superelastic shape memory alloy / Di Cui, Hong-Nan Li, Ping Guan -- Analysis of three-dimensional microscopic stress distributions at a free edge of a unidirectional CFRP laminate / Keita Goto, Tetsuya Matsuda -- The dynamic property and liquefaction analysis of earth dam / Deyong Wang, Xianqi Luo, Xiurun Ge -- Identification the interface fracture parameter by inverse analysis : Application of Kalman-filter technology / Bin Liu [und weitere] -
- Modeling of thermal stress during casting solidification process / Dunming Liao [und weitere] -- Prediction of forming limit diagrams of DP590 steel based on the M-K model with experimental verification / Yanshan Lou [und

weitere] -- Numerical simulation of radome with fluid-structure interaction / Xu Kun-Mei, Hu Yong, Tang Ye -- In-plane stability of derrick of inclined drilling rig / Z. Liang [und weitere] -- Torsional stiffness of laminated glass elements in structural applications - influence of a elasto-viscoplastic ionomer interlayer on the pre-breakage behaviour / Dieter Callewaert [und weitere] -- Bending stiffness of laminated glass elements in structural applications - influence of a elasto-viscoplastic ionomer interlayer on the pre-breakage behaviour / Dieter Callewaert [und weitere] -- On the inelastic constitutive equations of plates and shells made of foams / Holm Altenbach, Victor A. Eremeyev -- Experimental investigation of the influence of temperature on local bridging behaviour in laminated glass elements in post-breakage state / Dieter Callewaert [und weitere] -- Prediction of the plastic deformation of circular cylindrical shells / A. Darvizeh, H. Rajabi -- Plastic collapse of steel water towers / Wesley Vanlaere [und

weitere] -- A discussion on elastoplastic model of double yield surfaces / Xianqi Luo, Deyong Wang -- The numerical simulation on the cracks of the concrete cover under hoop reinforcement corrosion and expansion / Qiu Zhaoguo, Zhang Fengpeng, Liang Li -- Nonlinear analysis of FRP reinforced RC slab carrying capacity / Liu Jun, Zhang Fengpeng, Li Qing -- The time dependence research of buckling for delamination with elastic bridge in laminar composite material / Zhang Xiaochun, Liu Shushu -- Effect of loading rate on dynamic characteristics of reinforced concrete frame column / Debin Wang, Hongnan Li -- Energy-absorbing performance of nested tube systems under compression load / Chen Zong, Xue Pu -- Causes and preventive measures for cracks in anchored ends of prestressed concrete hollow slab beams / Yang Zhong, Liu Aiqun, Yin Yihui *Cellular and Porous Materials in Structures and Processes* - Holm Altenbach 2011-01-27
The book covers the state-of-the-art treatment in

modelling and experimental investigation of the mechanical behaviour of cellular and porous materials. Starting from the continuum mechanical modelling, to the numerical simulation, several important questions related to applications such as the fracture and impact behaviour are covered.

[Polymer Foams Handbook](#) - Nigel Mills
2007-03-23

This handbook explores the applications of polymer foams, and the properties that make them suitable for so many applications, in the detail required by postgraduate students, researchers and the many industrial engineers and designers who work with polymer foam in industry. It covers the mechanical properties of foams and foam microstructure, processing of foams, mechanical testing and analysis (using Finite element analysis). In addition, it uniquely offers a broader perspective on the actual engineering of foams and foam based (or foam including) products by including nine detailed

case studies which firmly plant the theory of the book in a real world context, making it ideal for both polymer engineers and chemists and mechanical engineers and product designers. * Complete coverage of the mechanical and design aspects of polymer foams from an acknowledged international expert: no other book is available with this breadth making this a plastics engineer's first choice for a single volume Handbook * Polymer foams are ubiquitous in modern life, used everywhere from running shoes to furniture, and this book includes nine extensive case studies covering each key class of application, including biomechanics * Offers a rigorous mechanical and microstructure perspective, plus a computer based chapter: Essential for engineers and designers alike.

Polyimides and Other High Temperature Polymers: Synthesis, Characterization and Applications, Volume 5 - Kash L. Mittal
2009-04-24

This volume documents the proceedings of the

"Second International Symposium on Polyimides and Other High Temperature Polymers: Synthesis, Characterization and Applications, held in Newark, New Jersey, December 3-6, 2001. Polyimides possess many desirable attributes, so this class of materials has found applications in many technologies ranging from **Pharmaceutical Extrusion Technology** - Isaac Ghebre-Sellassie 2018-03-05

The first edition of Pharmaceutical Extrusion Technology, published in 2003, was deemed the seminal book on pharmaceutical extrusion. Now it is expanded and improved, just like the usage of extrusion has expanded, improved and evolved into an accepted manufacturing technology to continuously mix active pharmaceutical ingredients with excipients for a myriad of traditional and novel dosage forms. Pharmaceutical Extrusion Technology, Second Edition reflects how this has spawned numerous research activities, in addition to hardware and process advancements. It offers new authors,

expanded chapters and contains all the extrusion related technical information necessary for the development, manufacturing, and marketing of pharmaceutical dosage forms. Key Features:
Reviews how extrusion has become an accepted technology to continuously mix active pharmaceutical ingredients with excipients
Focuses on equipment and process technology
Explains various extrusion system configurations as a manufacturing methodology for a variety of dosage forms
Presents new opportunities available only via extrusion and future trends
Includes contributions of experts from the process and equipment fields

Biodegradable Poly (hydroxyalkanoates) - Qi Liao 2010

Plastic materials have a huge impact to the environment. EPA statistics shows that less than 7% of the plastic products are being recycled, and many of the rest are sent to landfills or, in worse scenarios, end up in our natural environment. Poly(hydroxyalkanoates) (PHAs), a

family of biodegradable polyesters that can be produced by microbes fed on renewable carbon substrates, can be used as a "green" substitute to conventional plastics and help solve this environmental problem. However, difficulties remain for using PHAs at a sizable scale. Besides the high production cost, weaknesses in material properties, including narrow thermal processing window and insufficient melt elasticity, are also limiting the application of PHAs. Recent progress in PHA syntheses has resulted in new copolymers in the PHA family which are expected to possess improved properties. In this thesis, the melt properties of a series of one such copolymer, poly(3-hydroxybutyrate-co-3-hydroxyhexanoate) (P3HB-co-3HHx), with varying 3HHx content, were investigated. Results suggested that the presence of the propyl side groups on 3HHx increases the steric hindrance of the P3HB-co-3HHx chains, thus resulting in increased entanglement density, and subsequently, the melt elasticity. Solid-state

properties of P3HB-co-3HHx were also studied, and the effects on biodegradability of thin films of P3HB-co-3HHx were investigated. Results show that varying copolymer composition in combination with modifying the crystalline morphology through heat treatment may enable control over biodegradation rates for PHAs materials. In addition, biodegradable cellular foams made of PHAs were synthesized through extrusion foaming, a standard melt processing for thermoplastics. A commercial PHA copolymer, poly(3-hydroxybutyrate-co-3-hydroxyvalerate) (P3HB-co-3HV), was used and evaluated for its foamability. Another naturally-derived polymer, cellulose acetate butyrate (CAB), was chosen to blend with P3HB-co-3HV to enhance its melt properties and processability. It was found that blending significantly improved the thermal processing window and enhanced melt elasticity. Results showed that selectively combining two types of bio-based renewable polymer could be an

effective way to tune the melt properties and crystallinity and thus the processability.

Polymeric Foams Structure-Property-Performance - Bernard Obi 2017-12-14

Polymeric Foams

Structure-Property-Performance: A Design Guide is a response to the design challenges faced by engineers in a growing market with evolving standards, new regulations, and an ever-increasing variety of application types for polymeric foam. Bernard Obi, an author with wide experience in testing, characterizing, and applying polymer foams, approaches this emerging complexity with a practical design methodology that focuses on understanding the relationship between structure-properties of polymeric foams and their performance attributes. The book not only introduces the fundamentals of polymer and foam science and engineering, but also goes more in-depth, covering foam processing, properties, and uses for a variety of applications. By connecting the

diverse technologies of polymer science to those from foam science, and by linking both micro- and macrostructure-property relationships to key performance attributes, the book gives engineers the information required to solve pressing design problems involving the use of polymeric foams and to optimize foam performance. With a focus on applications in the automotive and transportation industries, as well as uses of foams in structural composites for lightweight applications, the author provides numerous case studies and design examples of real-life industrial problems from various industries and their solutions. Provides the science and engineering fundamentals relevant for solving polymer foam application problems Offers an exceptionally practical methodology to tackle the increasing complexity of real-world design challenges faced by engineers working with foams Discusses numerous case studies and design examples, with a focus on automotive and transportation Utilizes a practical design

methodology focused on understanding the relationship between structure-properties of polymeric foams and their performance attributes

Foaming with Supercritical Fluids - Ernesto Di Maio 2021-11-06

Foaming with Supercritical Fluids, Volume Nine provides a comprehensive description of the use of supercritical fluids as blowing agents in polymer foaming. To this aim, the fundamental issues on which the proper design and control of this process are rooted are discussed in detail, with specific attention devoted to the theoretical and experimental aspects of sorption thermodynamics of a blowing agent within a polymer, the effect of the absorbed blowing agent on the thermal, interfacial and rheological properties of the expanding matter, and the phase separation of the gaseous phase, and of the related bubble nucleation and growth phenomena. Several foaming technologies based on the use of supercritical blowing agents are

then described, addressing the main issues in the light of the underlying chemical-physical phenomena. Offers strong fundamentals on polymer properties important on foaming. Outlines the use of supercritical fluids for foaming. Covers theoretical points-of-view, including foam formation of the polymer/gas solution to the setting of the final foam. Discusses the several processing technologies and applications.

Military Injury Biomechanics - Melanie Franklyn 2017-06-12

Military Injury Biomechanics: The Cause and Prevention of Impact Injuries is a reference manual where information and data from a large number of sources, focussing on injuries related to military events, has been critically reviewed and discussed. The book covers the cause and prevention of impact injuries to all the major body regions, while topics such as the historical background of military impact biomechanics, the history and use of anthropomorphic test devices

for military applications and the medical management of injuries are also discussed. An international team of experts have been brought together to examine and review the topics. The book is intended for researchers, postgraduate students and others working or studying defence and impact injuries.

The Chemistry of Environmental Engineering - Johannes Karl Fink 2020-04-07

The focus of this book is the chemistry of environmental engineering and its applications, with a special emphasis on the use of polymers in this field. It explores the creation and use of polymers with special properties such as viscoelasticity and interpenetrating networks; examples of which include the creation of polymer-modified asphalt as well as polymers with bacterial adhesion properties. The text contains the issues of polymerization methods, recycling methods, wastewater treatment, types of contaminants, such as microplastics, organic dyes, and pharmaceutical residues. After a

detailed overview of polymers in Chapter 1, their special properties are discussed in the following chapter. Among the topics is the importance of polymers to water purification procedures, since their use in the formation of reverse osmosis membranes do not show biofouling. Chapter 3 details special processing methods, such as atom transfer radical polymerization, enzymatic polymerization, plasma treatment, and several other methods, can be used to meet the urgent demands of industrial applications. Chapter 4 addresses the important environmental issue of recycling methods as they relate to several types of materials such as PET bottles, tire rubbers, asphalt compositions, and other engineering resins. And wastewater treatment is detailed in Chapter 5, in which the types of contaminants, such as microplastics, organic dyes and pharmaceutical residues, are described and special methods for their proper removal are detailed along with types of adsorbents, including biosorbents. Still another important

issue for environmental engineering chemistry is pesticides. Chapter 6 is a thorough description of the development and fabrication of special sensors for the detection of certain pesticides. A detailed presentation of the electrical uses of polymer-based composites is given in Chapter 7, which include photovoltaic materials, solar cells, energy storage and dielectric applications, light-emitting polymers, and fast-charging batteries. And recent issues relating to food engineering, such as food ingredient tracing, protein engineering, biosensors and electronic tongues, are presented in Chapter 8. Finally, polymers used for medical applications are described in Chapter 9. These applications include drug delivery, tissue engineering, porous coatings and also the special methods used to fabricate such materials.

Natural Polymers and Biopolymers II -

Sylvain Caillol 2021-05-05

BioPolymers could be either natural polymers – polymer naturally occurring in Nature, such as

cellulose or starch..., or biobased polymers that are artificially synthesized from natural resources. Since the late 1990s, the polymer industry has faced two serious problems: global warming and anticipation of limitation to the access to fossil resources. One solution consists in the use of sustainable resources instead of fossil-based resources. Hence, biomass feedstocks are a promising resource and biopolymers are one of the most dynamic polymer areas. Additionally, biodegradability is a special functionality conferred to a material, biobased or not. Very recently, facing the awareness of the volumes of plastic wastes, biodegradable polymers are gaining increasing attention from the market and industrial community. This special issue of *Molecules* deals with the current scientific and industrial challenges of Natural and Biobased Polymers, through the access of new biobased monomers, improved thermo-mechanical properties, and by substitution of harmful substances. This themed

issue can be considered as a collection of highlights within the field of Natural Polymers and Biobased Polymers which clearly demonstrate the increased interest in this field. We hope that this will inspire researchers to further develop this area and thus contribute to a future more sustainable society.”

6th World Congress of Biomechanics (WCB 2010), 1 - 6 August 2010, Singapore - Chwee Teck Lim 2010-08-09

Biomechanics covers a wide field such as organ mechanics, tissue mechanics, cell mechanics to molecular mechanics. At the 6th World Congress of Biomechanics WCB 2010 in Singapore, authors presented the largest experimental studies, technologies and equipment. Special emphasis was placed on state-of-the-art technology and medical applications. This volume presents the Proceedings of the 6th WCB 2010 which was held in conjunction with the 14th International Conference on Biomedical Engineering (ICBME) & 5th Asia Pacific

Conference on Biomechanics (APBiomech). The peer reviewed scientific papers are arranged in the six themes Organ Mechanics, Tissue Mechanics, Cell Mechanics, Molecular Mechanics, Materials, Tools, Devices & Techniques, Special Topics.

Continuous Media with Microstructure 2 -
Bettina Albers 2016-02-09

This book presents research advances in the field of Continuous Media with Microstructure and considers the three complementary pillars of mechanical sciences: theory, research and computational simulation. It focuses on the

following problems: thermodynamic and mathematical modeling of materials with extensions of classical constitutive laws, single and multicomponent media including modern multifunctional materials, wave propagation, multiscale and multiphysics processes, phase transformations, and porous, granular and composite materials. The book presents the proceedings of the 2nd Conference on Continuous Media with Microstructure, which was held in 2015 in Łagów, Poland, in memory of Prof. Krzysztof Wilmański.